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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/550,157  | 09/20/2005  | Majd Alwan           | 00765-04            | 5323             |
| 34444 7590 06/02/2008<br>UNIVERSITY OF VIRGINIA PATENT FOUNDATION<br>250 WEST MAIN STREET, SUITE 300<br>CHARLOTTESVILLE, VA 22902 |             |                      |                     |                  |
| EXAMINER  |             |                      |                     |                  |
| PANI, JOHN  |             |                      |                     |                  |
| ART UNIT  |             | PAPER NUMBER         |                     |                  |
| 3736  |             |                      |                     |                  |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/550,157

**Applicant(s)**

ALWAN ET AL.

**Examiner**

JOHN PANI

**Art Unit**

3736

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 December 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/5508)
- Paper No(s)/Mail Date 12/17/07.
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Inventor's Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments filed 12/17/2007 have been fully considered but they are not persuasive. The Examiner respectfully disagrees with the Applicant's assertion that Hagy fails to show detecting acceleration, vibration, or deflection of the floor. The Applicant appears to assert that "the force plate assembly 20" is not the floor. However, the general definition of "floor" is "that part of a room, hallway, or the like, that forms its lower enclosing surface and upon which one walks" ("floor." Dictionary.com Unabridged (v 1.1). Random House, Inc. 27 May. 2008. <Dictionary.com <http://dictionary.reference.com/browse/floor>>.). The users walk on **20** (see Hagy, col. 3 lines 55-65), and thus it serves as the "floor" in that particular section of the testing room (see Fig. 1) in which it lies.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 7-9, 12-13, 15-17, 19-20, 22, 24-26, 28, 31-32, 34-38, 40 and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by US Pat. No. 3,894,437 to Hagy et al. ("Hagy").

4. Hagy teaches:

In reference to Claims 1, 24, and 41

A gait monitoring system, method, and computer usable medium containing computer logic that uses a processor in a computer system to monitor gait for monitoring gait characteristics of a subject comprising: a sensor module (force plate assembly **20**) that detects floor deflection to provide a deflection signal; and a processor module ("computer" is programmed to carry out detection and analysis, See Fig. 3 and col. 6 lines 30-37) that analyzes the deflection signal for determining gait characteristics.

In reference to Claims 2-4 and 25-27

The system and method of claims 1 and 24 (see above) further comprising outputting gait characteristics data to an output module that is a printer (The plotter is attached to the computer, which does the analysis, see Fig. 3 and col. 6 lines 30-37 and 48-53. Note that as written, claims 4 and 27 depend from claims 3 and 26 which are rejected with an output module that is a printer. Claims 4 and 27 as written do not require that the output module be a communication device from the list of modem, pager, etc.).

In reference to Claims 7 and 8

The system of claim 1 (see above), wherein said sensor module and processor module are in a hard wired communication using wire (see Fig. 3, the force plate assembly is wired to the computer/plotter).

In reference to Claims 9 and 28-29

The system and method of claims 1 and 24 (see above) further comprising detecting a rate-of-travel of the subject using a rate-of-travel detector (high speed camera **21**) to determine the rate of travel of the subject (Change in foot contact area from frame to frame, i.e. rate of travel of subject's foot per frame, of the motion picture is computed, see col. 10 lines 59-65.)

In reference to Claims 12-13 and 31-32

The system and method of claims 1, 9, 24, and 28 (see above) wherein the gait characteristics include the normal condition of the subject (see col. 11 lines 42-45).

In reference to Claims 15 and 34

The system and method of claims 1 and 24 (see above), further comprising storing data on an archival storage module (computations are recorded using plotter, etc. with respect to time, see col. 6 lines 50-53).

In reference to Claims 16-17 and 35-36

The system and method of claims 15 and 34 (see above) wherein the archival storage module stores a longitudinal analysis of gait characteristics and the processor module analyzes the gait characteristics (Torque force is computed by the computer, has longitudinal components, and is a gait characteristic, see col. 6 lines 48-53).

In reference to Claims 19-20 and 37-38

The system and method of claims 1 and 24 (see above) wherein the subject is a human and an animate object (see Fig. 9).

In reference to Claims 22 and 40

The system and method of claims 1 and 24 (see above) further comprising a step module that processes and analyzes a data signal received from the deflection module (The computer processes and analyzes the data received from the force plate. The data comes from the subject stepping. See col. 6 lines 38-53).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hagy in view of US2002/0107649 to Takiguchi et al. ("Takiguchi").

In reference to Claims 5-6

Hagy teaches the system of claim 1 (see above), but does not teach that the sensor module and processor module are in wireless communication. Takiguchi teaches connecting a sensor module (microphone) to a processor module (analyzer) can be done using a connecting cord or wireless communication such as infrared rays (see [0019]). It would have been obvious to one having ordinary skill in the art at the time of invention to have modified Hagy by using wireless infrared to connect the force plate with the computer, as taught by Hagy, as wired and wireless infrared are known equivalents and the substitution would provide the predictable result of exchanging information wirelessly, as taught by Hagy.

7. Claims 11 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hagy in view of US Pat. No. 5,831,937 to Weir et al. ("Weir").

In reference to Claims 11 and 30

Hagy teaches the system and method of claims 9 and 28 (see above), but does not disclose using ultrasonic communication in the rate-of-travel detector. Weir teaches a gait analysis system with a rate-of-travel detector that uses ultrasound and infrared (see col. 4 line 65 – col. 5 line 44). Weir further teaches that walking speed is one of the better indicator's of a person's overall gait (see col. 1 lines 16-35). It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the system and method taught by Hagy by including a rate-of-travel detector that uses ultrasound and infrared as taught by Weir, because the device of Weir determines the walking speed which is a good indicator of overall gait.

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hagy in view of Weir and US Pat. No. 6,006,165 to Okada ("Okada").

In reference to Claim 10

Hagy teaches the system of claim 9 (see above), but does not disclose using a rate-of-travel detector with a plurality of beam breaks, floor switches, or door switches. Weir teaches a gait analysis system with a rate-of-travel detector that uses ultrasound and infrared (see col. 4 line 65 – col. 5 line 44). Weir further teaches that walking speed is one of the better indicator's of a person's overall gait (see col. 1 lines 16-35). Okada

teaches of a speed measuring apparatus that uses a plurality of beam breaks (see col. 3 lines 1-45). It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the system of Hagy by including a rate-of-travel detector that detects speed, as taught by Weir, and it would have been further obvious to have used a speed measuring apparatus that includes a plurality of beam breaks, as taught by Okada, because both Okada and Weir teach speed measuring devices, and the substitution would yield the predictable result of determining a subject's speed.

9. Claims 14, 18, 21, 23, 33, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hagy in view of "Movement awareness for a sentient environment" to Headon ("Headon").

In reference to Claims 14, 18, 21, 23, 33, and 39

Hagy teaches the system and method of claims 1 and 24 (see above), but does disclose that the gait characteristics include determining falls. Headon teaches of force-plate based system that analyzes the ground reaction force and uses it to determine a number of things including fall detection (see Fig. 1). The device includes a plurality of modules ("Open and closed loop applications", see Fig. 1), which analyze and process data from a deflection module (the force plate) and analyze gait characteristics, such as fall detection data. It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the system and method of Hagy by including an application module with the ability to detect falls in the elderly, as taught by Headon, because this would expand diagnostic capabilities of the device.



***Conclusion***

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN PANI whose telephone number is (571)270-1996. The examiner can normally be reached on Monday-Friday 7:30 am - 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Max Hindenburg can be reached on 571-272-4726. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3736

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JP 5/27/08

/Max Hindenburg/  
Supervisory Patent Examiner, Art Unit 3736